New fuel cycle optimization can save utilities millions

Photo: Dr. Asgari

Dr. Mehdi Asgari leads the fuel cycle analysis group under the Reactor and Nuclear Physics department at INL.

As a member of a team from Exelon and Global Nuclear Fuel, INL's Dr. Mehdi Asgari has been honored with a Nuclear Energy Institute (NEI) Top Industry Practice (TIP) Award for the design and implementation of a fuel cycle technique that can save nuclear utilities millions of dollars. TIP awards recognize innovations in the nuclear industry that lead to greater safety, efficiency and cost-savings industry-wide.

Dr. Asgari's work in the area of nuclear fuel cycle optimization while serving as Technical Program Manager at Global Nuclear Fuel lead to a time-and money-saving innovation called N-Streaming^{SM}. N-Streaming takes advantage of special optimization software to develop multiple number (N) of customized bundles (streams) of nuclear fuel and deliver them to specific areas in the reactor core. "This task is otherwise so time consuming and difficult that current practice is typically limited to one or two streams for a given fuel cycle," says Dr. Asgari.

N-Streaming allows utilities to choose from a palette of pre-specified fuel rod types to build any number custom fuel bundle designs. Customized bundles offset specific "problem" areas in the core, resulting in better operating margins, fuel utilization and energy output.

"Exelon's Peach Bottom Unit 2 Cycle 17 in York County, Pennsylvania was the first commercial plant to have implemented the system," says Dr. Asgari. The N-Streaming technique with seven streams design translated to a savings of 8 fuel bundles per cycle - about $2 million for a two-year fuel cycle. The batch size reduction also translates into back-end fuel cycle storage savings for the spent fuel.

Dr. Asgari came to INL in October 2006, where he now leads the fuel cycle analysis group under the Reactor and Nuclear Physics department working on transmutation and fuel cycle analysis for fast reactors under the Global Nuclear Energy Partnership.

NEI will present the awards on May, 24, 2007.

General Contact:
Teri Ehresman, (208) 526-7785,

Feature Archive

Photo: fuel bundles

Two fresh bundle types.

Photo: fuel bundles

"N" fresh bundle types.